

adjustable by extension and contraction and being fixed on the mount (7) by means of the female screw (5); that one end of the above-designated driving rod (6) contacts one side of the upper clamping means (8) via the steel ball (21), whereas the other side of the above-designated upper clamping means (8) contacts the supporting piston (11) via the axle bearing (9) and the axis (10), the supporting oil tank (12) provided behind the above-designated supporting piston (11) being filled inside with oil; that there is moreover a connection via the oil line (22) and energy-storage oil tank (19), the energy-storage piston (18) being provided at the upper half of the above-designated energy-storage oil tank (19), a connection existing between the upper end of the above-designated energy-storage piston (18) and the upper crossbar (17-a), and both ends of the above-designated upper crossbar (17-a) being connected to the lower crossbar (17-b) via the cantilever (16); that moreover a weight (20) is provided on the cantilever (16) in the middle of the lower crossbar (17-b), the specimen (13) being supported by the above-designated upper clamping means (8) and lower clamping means (14) and there is contact at the bottom of the above-designated lower clamping means (14) with the branch part (15) and the mount (7).

2. The low-load fatigue testing device according to claim 1, characterized in that the throw of the eccentricity is adjusted by the position of attachment of the eccentric axis (3) in the T-shaped groove at the end of the driving axle (1).
3. The low-load fatigue testing device according to claim 1, characterized in that a gas-discharge-valve is provided at the opening b on the upper end of the energy-storage piston (18) and that an oil line (22) is provided at the oil-inlet and oil-outlet opening a on the

left side of the energy-storage oil tank (19) and an oil-inlet valve is also provided at the opening c on the right side.

### **Description**

#### **Low-Load Fatigue Testing Device**

The following utility model pertains to a low-load fatigue testing device, in particular to a material testing device for fatigue tests having a load of 20-200 N. The control is effected by position displacement.

Presently, fatigue tests for small pipe parts, etc. are normally carried out on a fatigue testing device having curved bars. During passage from top and bottom dead centre, the occurrence of shocks cannot be avoided, which means additional dynamic load. Testing devices having a hydraulic servo-device, however, are very expensive.

The object of the present invention is to overcome the deficiencies mentioned above regarding the additional shocks during passage from top and bottom dead centre as well as to design a hydraulic-mechanical, low-load fatigue testing device having storage of energy. The price of the device according to the invention is suitable for the circumstances prevailing in the People's Republic of China.

The technical design of the present utility model is stated below: The present utility model is based on a hydraulic-mechanical principle.

A T-shaped groove is provided on the upper face of a driving axle, the eccentric axis being attached in the above-designated T-shaped groove. At the end of the above-designated eccentric axis an axle bearing is provided, the

outer ring of the above-designated axle bearing being connected with a driving rod via an adjustment wire. The above-designated driving rod can be extended and contracted and is attached to a mount by means of a female screw. One end of the above-designated driving rod contacts one side of the upper clamping means via a steel ball, whereas the other side of the above-designated upper clamping means contacts a supporting piston via an axle bearing and an axis. The supporting oil tank provided behind the above-designated supporting piston is filled inside with oil and is connected with an oil line and an energy-storage oil tank. An energy-storage piston is provided on the upper half of the above-designated energy-storage oil tank, a connection existing between the upper end of the above-designated energy-storage piston and an upper crossbar, and both ends of the above-designated upper crossbar are connected with a lower crossbar via a cantilever. A weight is provided on the cantilever in the middle of the above-designated lower crossbar, the specimen being supported by the above-designated upper clamping means and a lower clamping means, and there is contact at the bottom of the above-designated lower clamping means with a branch part and a mount. The above-designated steel ball is clamped in at the rear end of the driving rod.

A gas-discharge-valve is provided at the opening b on the upper end of the energy-storage piston and an oil line is provided at the oil-inlet and oil-outlet opening a on the left side of the energy-storage oil tank and an oil-inlet valve is also provided at the opening c on the right side.

The throw of the eccentricity is adjusted by the position of attachment of the above-designated eccentric axis in the above-designated T-shaped groove at the end of the above-designated driving axle.

The present utility model has the characteristics stated below:

1. The constructive design is simple and small as well as light in weight.
2. By combining hydraulic and mechanic principles, a creative fatigue testing device is provided.
3. Thus, the possibility is provided to carry out fatigue tests for small pipe parts and small bar parts.

The drawing of the construction of the present utility model is for the purpose of further explanation:

1. driving axle, 2. axle bearing, 3. eccentric axis, 4. adjustment wire, 5. female screw, 6. driving rod, 7. mount, 8. upper clamping means, 9. axle bearing, 10. axis, 11. supporting piston, 12. supporting oil tank, 13. specimen, 14. lower clamping means, 15. branch part, 16. cantilever, 17. crossbar, 18. energy-storage piston, 19. energy-storage oil tank, 20. weight, 21. steel ball, 22. oil line, a. oil-inlet and oil-outlet line, b. gas-discharge-valve, c. oil-inlet valve, A. bottom dead centre, B. top dead centre.

A detailed explanation of the present utility model is given below using the annexed drawings:

The specimen is clamped between the upper clamping means 8 and the lower clamping means 14. A top dead centre B as well as a bottom dead centre A are provided on the eccentric-load device. When the eccentric is positioned to the left on the bottom dead centre A, the added weight is supposed to maintain the inner pressure on the horizontal driving chain. When the eccentric axle bearing 2 switches from the bottom dead centre A to the top dead centre B, the load locus of the specimen 13 shifts towards the right via the adjustment wire 4, the driving rod 6, the steel ball 21 and the upper clamping means 8. Simultaneously, the supporting piston 11 is moved to the right by the upper clamping means 8, the axle bearing 9 and the axis 10. The oil in the supporting oil tank 12 is pressed through the oil line 22 into the en-

ergy-storage oil tank 19. Simultaneously, the lifting of the energy-storage piston 18 and the weight 20 occurs. When the eccentric reaches the top dead centre B, the weight 20 reaches its highest position. When the eccentric returns from the top dead centre B to the bottom dead centre A, the driving effect on the specimen is lost. The energy of the weight lowers the energy-storage piston 18, and the oil in the energy-storage oil tank 19 is pressed through the oil line 22 into the rear part of the supporting oil tank 12. The supporting piston 11 is pressed to the left, and the specimen is pressed by the axis 10, the axle bearing 9 and the upper clamping means 8, and the load locus of the specimen is shifted from the maximum right-hand position to the maximum left-hand position. A cycle has thus been carried out. If this process is repeated until the specimen breaks, a fatigue test of the specimen has been accomplished.

The throw of the position change is adjusted by the eccentric axis 12.